



4023 Series

User Manual

May 15, 2013

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FCC WARNING

Computing devices and peripherals manufactured by Daisy Data Displays generate, use, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions in this manual may cause interference to radio communications. Such equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against radio interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user - at his own expense - will be required to take whatever measures may be required to correct the interference.

Some components may not have been manufactured by Daisy Data Displays, Inc. If not, Daisy has been advised by the manufacturer of the component that the component has been tested and complies with the Class A computing device limits as described above.

Daisy Data Displays, Inc.
2850 Lewisberry Road
York Haven, PA 17370 USA
Phone: (717) 932-9999
Fax: (717) 932-9000
www.d3inc.net

May 2013
Manual Revision 3.0

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Limited Warranty and Liability Statement

To the original purchaser, Daisy Data Displays, Inc., hereinafter referred to collectively as SELLER, warrants each of its manufactured products, and all components therein contained to be free from defects in materials and/or workmanship for a period of 12 months from the date of purchase.

Should a malfunction, or other indication of defect attributable directly to faulty materials and/or workmanship occur, Seller will, at its option, and without charge to the customer for labor and parts, repair or replace the defective product, F.O.B. Seller's plant, but Seller will not be responsible for freight from Purchaser to Seller's plant. In no event shall Seller be liable for any loss, inconvenience or damage, whether direct, incidental, consequential or otherwise resulting from abuse, misapplication or modification of the product, improper or faulty power, damage resulting from repairs or alterations performed by unauthorized persons, or conditions resulting from any other equipment attached to the product.

Seller assumes no liability for damage occurring in transit due to the product not being returned in its original shipping material.

This warranty is exclusive and is in lieu of any warranty of merchantability or fitness for a particular purpose or other warranty of quality whether expressed or implied, except of title and against patent infringement. Correction of nonconformities, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of the Seller to the Purchaser with respect to, or arising out of the goods, whether based on contract, negligence, strict tort or otherwise.

LIMITATION OF LIABILITY: The Seller shall not under any circumstances be liable for special or consequential damages, such as, but not limited to, damage or loss of other property or equipment, loss of profits or revenues, cost of capital, cost of purchased or replacement goods, or claims of customers of Purchaser for service interruptions. The remedies of the Purchaser set forth herein are exclusive, and the liability of Seller respect to any contract, or anything done in connection therewith such as the performance or breach thereof, of from the manufacture, sale, delivery, resale, installation or use of any goods covered by or furnished under this contract whether arising out of contract, negligence, strict tort or breach of warranty or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based.

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. Seller makes every effort to provide clear and accurate technical information on the application of its products in the Operator's Manual, and assumes no liability for misuse of the information.

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I. Revisions

REV	Description	Date	Author
1.0	Initial	5/14/12	RP
2.0	Expanded to include other model, 4023AA;	9/3/12	RP
3.0	Updated to include new ratings, UL Listing guidelines added	5/15/13	RP

II. Introduction

Thank you for selection a D3 solution for your hazardous area operator interface needs.

This manual reviews procedures for installing and operating D3 flat panel operator interface systems. In addition to the setup instructions and diagrams in this manual, D3 provides an overview of the methods used to ensure that electronic systems are safe for hazardous areas. This explains the theory behind the unique product and services provided by D3.

Should you have any inquiries or concerns, please contact D3.



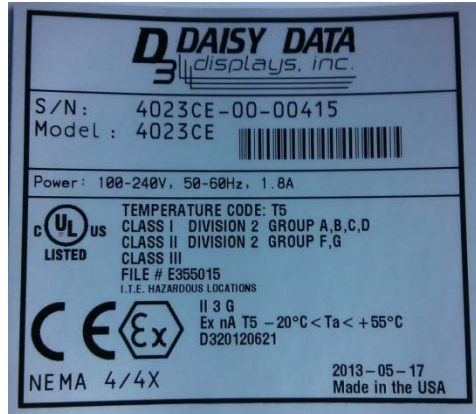
Customer Service

All Daisy systems pass detailed quality control configuration and inspection before being shipped. D3 strives to create the highest quality systems, and chooses top quality parts. However, like most electronic devices, units may experience issues over time. Should you experience problems, or have any further inquiries or comments, please contact D3's customer service department:

Business Phone (717) 932-9999 x 222
Fax (717) 932-8000
Email support@d3inc.net

Equipment returned to D3 for service must be accompanied by a valid return merchandise authorization (RMA) number. Items or products shipped to D3 without a valid RMA number will be refused. An RMA will be generated upon receipt of Company Name, Address, Contact, Product Model and Serial Numbers.

Model/Serial Number Tag Example




Daisy Data Displays Inc. prides itself on offering best in class support for your products. Our technical support team can help you with installation, configuration, troubleshooting, and other support issues for all D3's products.

III. Unit Certifications

The **4023CE** and **4023** (see page 13 for additional details) are UL Listed, **E355015**, and suitable for the following:

Class I, Division II, Groups A, B, C, D
Class II, Division II, Groups F, G
Class III
Temperature Code T5
 $-20^{\circ}\text{C} < T_{\text{amb}} < 55^{\circ}\text{C}$

These units are also ATEX Zone 2 rated as such:

 II, 3G, Ex, nA, IIC, T5

The **4023** with options (e.g. 4023-796) other than those incorporated in the UL Listing, as well as any other 4023xx variant are NOT UL Listed. The 4023AA currently carries the following ATEX Zone 2 certification:

 II, 3G, Ex, nA, IIC, T4

IV. Specifications

Materials

All materials comply with NEMA 4X standards

Enclosure and Hardware..... 6061-T6 Aluminum

Mechanical

See drawings for dimensions

Environmental

Operating Temperature (No Heater)..... -20°C – 55°C

Operating Temperature (Heater Equipped) -40°C - 65°C

Storage Temperature..... -20°C – 75°C

Relative Humidity..... 5% - 95%

Electrical

Voltage 100- 240 VAC, 50/60 Hz

Current 1.8A

Air Requirements

Air Pressure No Air Required

Display

Resolution Maximum 1280x768

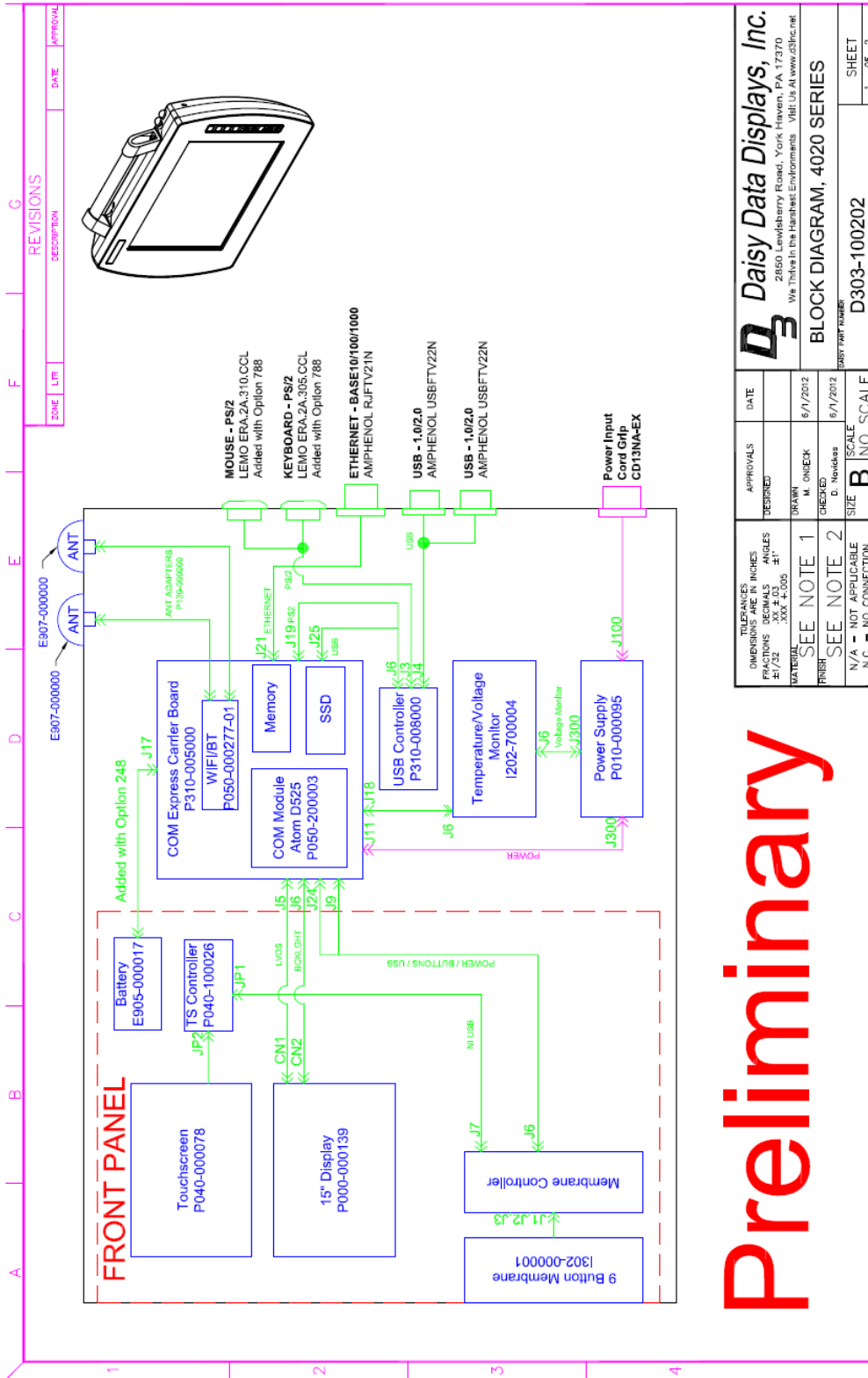
Viewing Angle..... 80° x 80°

Typical Brightness..... 600 nits

Color Depth 24 bit

***Note: Due to frequent technological advances, please contact D3 for latest model specifications.**

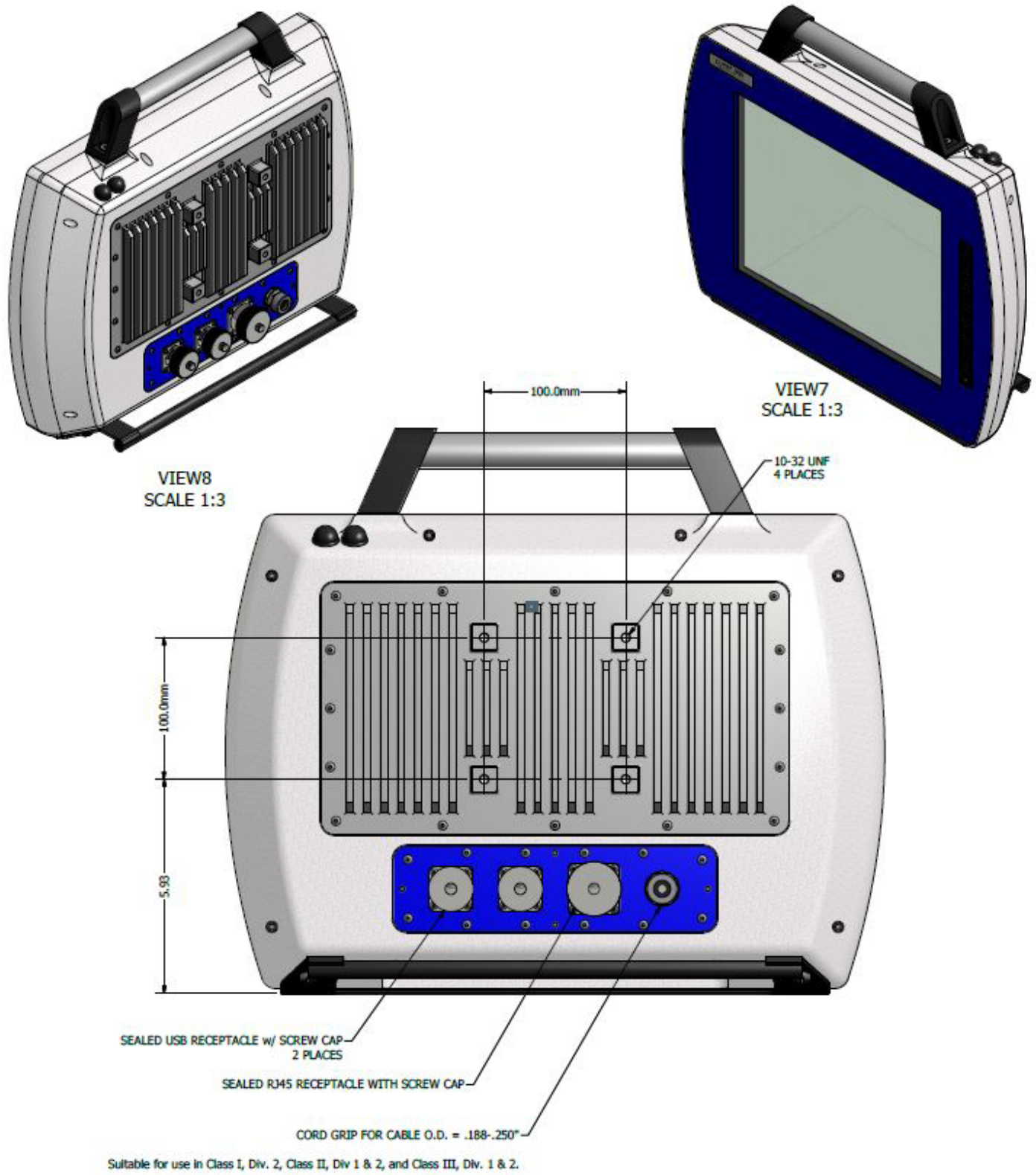
V. Block Diagram (4023CE)



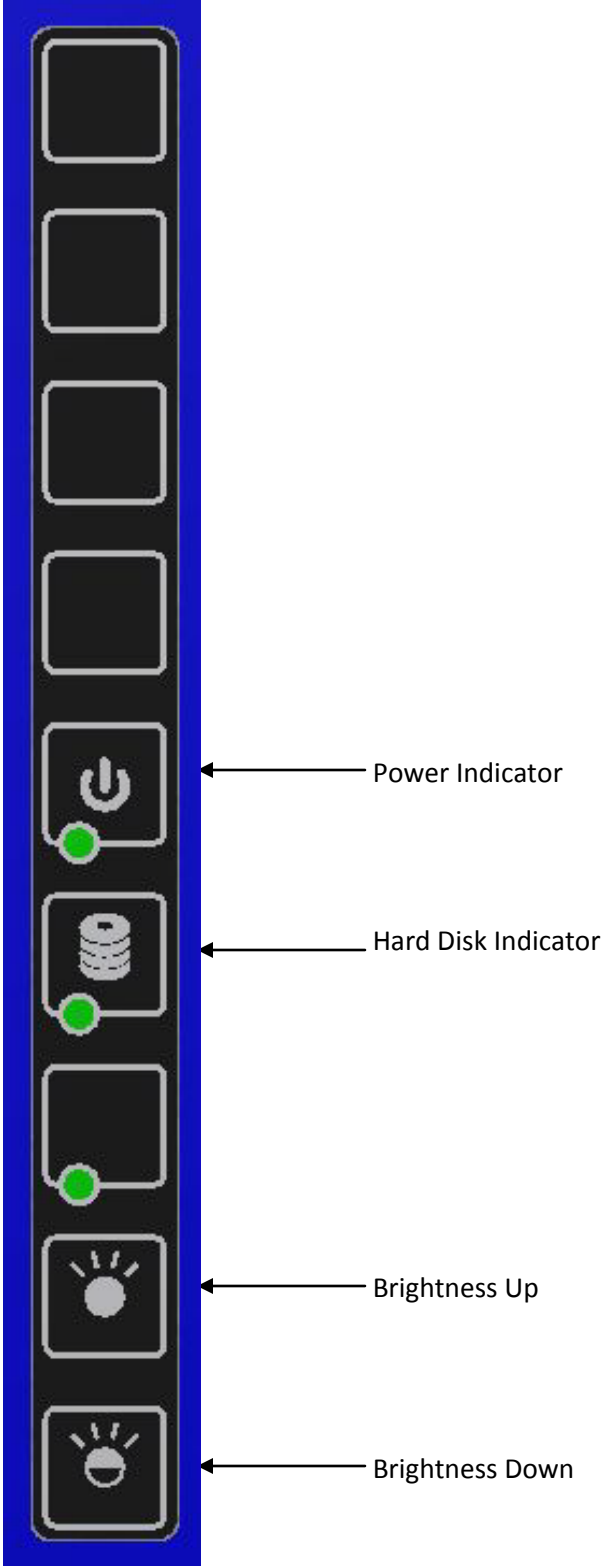
D3 Daisy Data Displays, Inc. 2850 Lewisberry Road, York Haven, PA 17370 We Make It the Hardest Environments - We'll Use At www.d3inc.net		DATE	APPROVALS
BLOCK DIAGRAM, 4020 SERIES		DESIGNED	
DRAWN	M. ONICK	6/1/2012	
CHECKED	D. Neidhaas	6/1/2012	
SCALE	NO SCALE		
SIZE	B		
PART NUMBER	D303-100202		
SHEET	1	OF	2

Preliminary

VI. Mounting Diagram



VII. Keypad Layout



VIII. Installation & Warnings

WARNING: EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.

WARNING: EXPLOSION HAZARD – SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

Unit and connections must be installed per Control Drawing No. D305-100009 (See page 16). For supply connections, use wires suitable for at least 75°C.

Use Copper, Copper-Clad Aluminum, or Aluminum Conductors.

The 4023CE and 4023 are UL Listed with a Hoffman hole plug. End user is responsible for installation of power input to unit. For proper use, all field wiring must be in compliance with applicable standards for Class I, Division 2 classified areas or for ATEX Zone 2 areas, whichever may be applicable. Installation must be done by a person familiar with the local regulations.

To Access Power Receptacle

1. Verify unit is in a nonhazardous area.
2. Unscrew the 10-32 button head screws around the gland plate and remove the plate to access the Phoenix block.
3. Route cable through plate hole or hole plug (if equipped).
4. Connect power input to block and secure with contact screws.
5. Reposition the gland plate, reapply Loctite Blue 242 (if desired), and torque the 10-32 button head screws to 10in-lb. using a calibrated torque-limiting screw driver.

IX. Parts List

There are multiple variations of the 4023 throughout the series. While some parts (options) will allow for increased functionality and more versatile usage, they may not yet have been certified for use through an accredited testing laboratory, or have been certified for ATEX Zone 2 for suitability of usage. Below are tables designating the main components for 4023 models.

Table 1 - 4023 - UL Listed/ATEX Zone 2 Certified

4023 – UL Listed, ATEX Zone 2 Certified	
Part Description	Daisy Part Number
Motherboard – COM Express	P310-005000
Antennas	E907-000000
USB Controller Board	P310-008000
15" Capacitive Touch Screen	P040-000078
Touch Screen Controller	P040-100026
Nine Button Membrane	I302-000001
Membrane Controller	P310-009000
15" LCD Display	P000-000139
Optional Battery (Option 248)	E905-000017
RJ45 Connector & Cabling	I100-002099
USB Connector (x2) & Cabling	I100-002098
Power Supply	P010-000095

Table 1 presents the 4023 in its base configuration which has been sampled and listed by Underwriters Laboratories, and is also ATEX Zone 2 certified as shown on page 7. This is a restricted configuration which allows for only slight modification (gland plate location, option for rechargeable battery pack, and alternate chipsets and memory options). *User modifications will void the UL certification.*

Table 2 - 4023CE - UL Listed/ATEX Zone 2 Certified

4023CE – UL Listed, ATEX Zone 2 Certified (UL Certified Options Added to 4023)	
LEMO PS/2 Keyboard and Mouse (Option 788)	E203-200005 (Mouse), E203-200010 (Keyboard)

Table 2 presents the 4023CE, which is the base configuration of the 4023 from table 1, with the 788 option added for LEMO PS/2 connectors for keyboard and mouse connection. This option was included in the scope of the UL certification. The unit is also ATEX Zone 2 certified as shown on page 7.

Table 3 - 4023AA - ATEX Zone 2 Certified

4023AA – ATEX Zone 2 Certified <u>ONLY</u> (Non-UL Certified Options Added to 4023)	
Motherboard – Axiomtek	P050-000274-01
15” LED Backlit LCD Display	P000-000129
Backlight Inverter	P005-000003
Power Supply	P010-000093

Table 3 presents the 4023AA. It is a modification of the base 4023, with a different motherboard, a 15” LED backlight LCD display and inverter, and an alternate power supply. Due to these variations not being included in the UL Certification project, this unit is only ATEX Zone 2 Certified, as shown on Page 7. Future certification projects may incorporate these options.

Table 4 – Non-UL Certified Options

Additional 4023 Non-UL Certified Options to Add – ATEX Zone 2 Certified	
Optional AC Heaters	Option 796
Optional DC Heaters	Option 899
Optional Thermostats – Paired with Option 796	Option 796
Resistive Touch Screen	Option 233

Table 4 presents additional options for the 4023 which are not UL certified. They are included in the ATEX Zone 2 certification under a higher temperature class than the base configuration, as shown on page 7. Future certification projects may incorporate these options.

X. Battery Storage & Operation

The standard battery incorporated into the UL Listed 4023 is designed as a backup power source. In the instance of a loss of primary power, the computer will run off of its Lithium-Ion battery. The battery pack is a 14.4VDC, 6.6 Ah pack in a compact form factor. As such, it will only run the computer for up to approximately one (1) hour. It can be used in short cycles solely on battery, however it is recommended that the 4023 is used as a mounted, hardwired computer.

Charging: The battery charges when the unit is connected to its power source, and ends its charge cycle when at full capacity. A full charge will take about three hours to charge.

Storage: Though the battery is embedded in a weather resistant enclosure and the 4023 storage temperature is -20°C to +75°C, it is recommended that the battery not be subjected to long term storage at a temperature outside -20°C to +60°C. For ideal battery life, the battery should be within 30-50% capacity before placed into storage.

Life Expectancy: Under normal use and storage, the battery can be expected to deliver 80% or more of its initial capacity after 300 charge cycles.

WARNING: BATTERY IS NOT TO BE REMOVED AND REPLACED BY USERS.

XI. Touch Screen Calibration

Each touch screen for the 4023 is calibrated and verified at D3 before the unit is shipped. Occasionally settings may get altered and the 4023 will require recalibration. In order to do so, perform the following simple procedure:

1. Locate the Microtouch application. Unless otherwise configured, a shortcut should be on the desktop. Run the application.
2. Click the Calibrate button in the application.
3. Follow the onscreen instructions and perform the calibration.
4. Exit the application and the process is finished.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
-	Initial	June 28, 2013	RFR



PROPRIETARY INFORMATION OF

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CONTROL DRAWING

ALL SHEETS MAINTAINED AT THE SAME REVISION LEVEL

PART NUMBER(S): 4023	INITIAL APPROVAL DATE	
	5/9/2013	
Engineering	Gregory Drapcho	
Quality Control	Marty Etnoyer	
Administration	Michael Hadaway	Model 4023 Nonincendive Field Wiring Control Drawing

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
DECIMALS FRACTIONS
2 PL±XX ±XXXX

Daisy Data Displays, Inc.
2850 Lewisberry Road
York Haven, PA 17370
717-932-9999

D305-100009

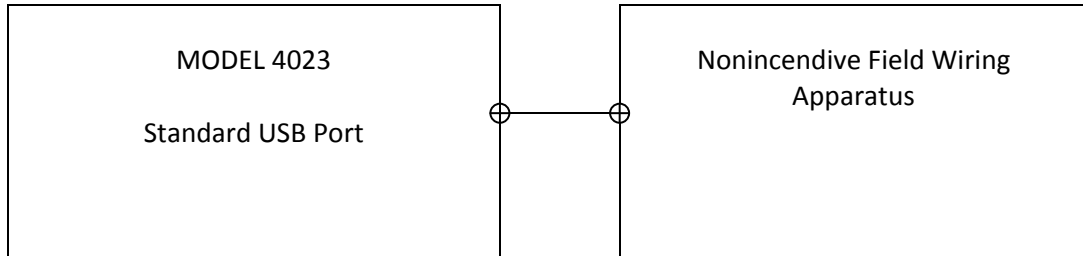
SCALE: NONE

SHEET 1 of 5

I. USB Wiring

Used in:

- Class I Division 2 Groups A, B, C, and D
- Class II Division 2 Groups E, F, and G
- Class III Division 2



Notes:

1. Nonincendive Field Wiring Entity Parameters:

- Voc = 5.1 V
- Isc = 450 mA
- Ca = 999 μ F
- La = 395 μ H

2. Selected Associated Nonincendive Field Wiring Apparatus shall satisfy the following:

Nonincendive Equipment		Associated Apparatus
Vmax	\geq	Voc
I _{max}	\geq	Isc
C _i + C _{cable}	\leq	Ca
L _i + L _{cable}	\leq	La

3. If the electrical parameters of the cable are unknown, the following values may be used:

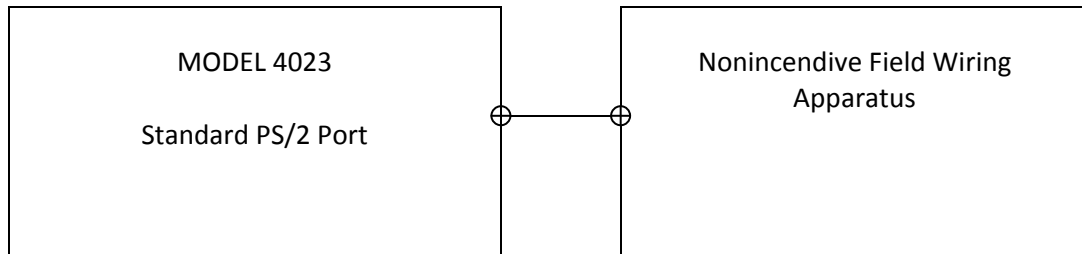
- Capacitance = 60 pF/ft
- Inductive = 0.20 μ H/ft

- 4. Nonincendive Field Wiring must be installed in accordance with article 501.10(B) of the National Electric Code ANSI/NFPA 70.
- 5. Nonincendive Field Wiring Apparatus shall not contain or be connected to another power source.

II. PS/2 Wiring

Used in:

- Class I Division 2 Groups A, B, C, and D
- Class II Division 2 Groups E, F, and G
- Class III Division 2



Notes:

1. Nonincendive Field Wiring Entity Parameters:

- $V_{oc} = 5.1 \text{ V}$
- $I_{sc} = 1063 \text{ mA}$
- $C_a = 989 \text{ } \mu\text{F}$
- $L_a = 70 \text{ } \mu\text{H}$

2. Selected Associated Nonincendive Field Wiring Apparatus shall satisfy the following:

Nonincendive Equipment		Associated Apparatus
V_{max}	\geq	V_{oc}
I_{max}	\geq	I_{sc}
$C_i + C_{cable}$	\leq	C_a
$L_i + L_{cable}$	\leq	L_a

3. If the electrical parameters of the cable are unknown, the following values may be used:

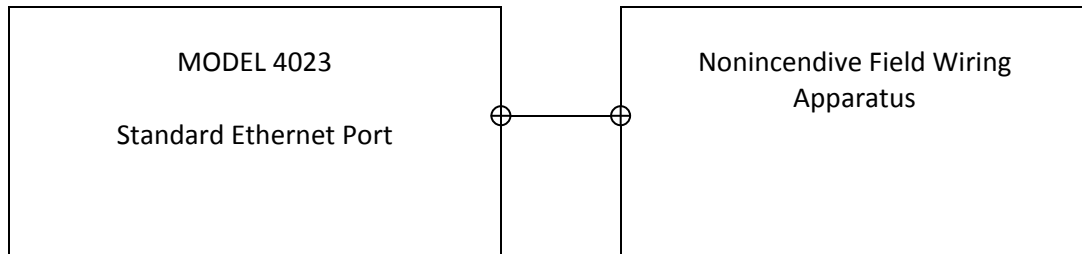
- Capacitance = 60 pF/ft
- Inductive = 0.20 $\mu\text{H}/\text{ft}$

- 4. Nonincendive Field Wiring must be installed in accordance with article 501.10(B) of the National Electric Code ANSI/NFPA 70.
- 5. Nonincendive Field Wiring Apparatus shall not contain or be connected to another power source.

III. Ethernet Wiring

Used in:

- Class I Division 2 Groups A, B, C, and D
- Class II Division 2 Groups E, F, and G
- Class III Division 2



Notes:

1. Nonincendive Field Wiring Entity Parameters:

- $V_{max} = 5.5 \text{ V}$ $V_{oc} = 5.5 \text{ V}$
- $I_{max} = 100 \text{ mA}$ $I_{sc} = 100 \text{ mA}$
- $C_i = 1000 \text{ pF}$ $C_a = 1000 \text{ }\mu\text{F}$
- $L_i = 0.5 \text{ }\mu\text{H}$ $L_a = 8 \text{ mH}$

2. Selected Associated Nonincendive Field Wiring Apparatus shall satisfy the following:

Nonincendive Equipment		Associated Apparatus
V_{max}	\geq	V_{oc}
I_{max}	\geq	I_{sc}
$C_i + C_{cable}$	\leq	C_a
$L_i + L_{cable}$	\leq	L_a
V_{oc}	\leq	V_{max}
I_{sc}	\leq	I_{max}
C_a	\geq	$C_i + C_{cable}$
L_a	\geq	$L_i + L_{cable}$

3. If the electrical parameters of the cable are unknown, the following values may be used:

- Capacitance = 60 pF/ft
- Inductive = 0.20 $\mu\text{H}/\text{ft}$

4. Nonincendive Field Wiring must be installed in accordance with article 501.10(B) of the National Electric Code ANSI/NFPA 70.

IV. Revision History

REVISION	CHANGE DESCRIPTION	DATE	AUTHOR
-	Initial	June 28, 2013	RFR